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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,204	02/27/2004	Toshihisa Nozawa	09459.0001	4678

22852 7590 04/18/2006

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EXAMINER

DHINGRA, RAKESH KUMAR

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 04/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/787,204

Applicant(s)

NOZAWA ET AL.

Examiner

Rakesh K. Dhingra

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2,3,6-9 and 11-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2,3,6-9 and 11-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection as explained hereunder.

Applicant has amended claims 2, 3, 6-9 and 11-18 by adding new limitations and deleted claims 1, 4, 5, 10.

Examiner responds that new reference by Schmitt (US PGPub No. 2004/0052972) has been found that reads on independent claims 2, 11. Accordingly claims 2, 11 have been rejected under 35 USC 102 (e).

Further dependent claims 3, 6-9, 12-18 have been rejected under 35 USC 103 (a) as explained below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 2, 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Schmitt (US PGPub. No. 2004/0052972).

Regarding Claims 2, 11: Schmitt teaches a substrate processing apparatus (Figure 3) comprising:

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an outer enclosure 11 having reactive enclosures (process chambers) 24, 34 in which a substrate 8 is plasma-processed;

gas introducing mechanisms 20, 30 configured to introduce gas into said process chambers;

a rotary turntable (holding mechanism) 7 having a surface provided in the process chamber and configured to horizontally hold the substrate 8 on the surface;

exhaust pipes (first exhaust mechanism) 42, 43 having gaps (first exhaust port) 21, 31 positioned higher than a surface of the substrate 8 on the holding mechanism 7 in the process chamber, and configured to exhaust an inside of the process chamber when a gas for plasma processing is introduced into the process chamber by the gas introducing mechanism to plasma-process the substrate; and

a second exhaust pipe (mechanism) 55 having a second exhaust port positioned lower than the holding mechanism in the process chamber and configured to exhaust the inside of the process chamber. Schmitt also teach that reaction gas in the reactive zones can be in plasma form (paragraphs 0025 - 0032). Further, use of cleaning gas is an intended function which the apparatus of prior art is capable of performing.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitt (US PGPub No. 2004/0052972 in view of Xi et al (US PGPub. No. 2003/0198754).

Regarding Claims 3,12: Schmitt teaches all limitations of the claim but do not teach a hoisting/lowering mechanism configured to move the holding mechanism upward when the substrate is plasma-processed, and move the support mechanism downward when the inside of the chamber is cleaned, wherein the first exhaust port is positioned higher than the surface of the substrate on the holding mechanism that has been moved up by the hoisting/lowering mechanism, and wherein the second exhaust port is positioned lower than the holding mechanism that has been moved down by the hoisting/lowering mechanism.

Xi et al teach an apparatus (Figures 1, 9) that includes a process chamber 10 with dual exhausts 18A, 18B, substrate support pedestal 46 and a lift assembly (hoisting /lowering mechanism) 48 that enables up/down movement of support pedestal. Xi et al further teach that at any given moment either one, or both or none of the exhaust is

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open to cavity. Xi further teach a controller 70 that regulates the operation of various components of the processing system (includes control of first and second exhaust ports, up/down movement of holding mechanism during processing operations (paragraphs 0031-0032, 0041, 0058).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a hoisting/lowering mechanism and a system controller as taught by Xi et al in the apparatus of Schmitt to enable alter height of substrate holder and also provide control and regulation over various sub-systems of the processing system.

Claims 6, 7, 13, 14, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitt (US PGPub No. 2004/0052972 in view of Rossman (US PGPub. No. 2003/0211735)

Regarding Claims 6, 13: Schmitt teaches all limitations of the claim but do not expressly teach concurrent exhausting by the first and second exhaust channels.

Rossman teaches a substrate processing apparatus (Figures 6, 7A) comprising:

a process chamber 113 in which a substrate 117 is plasma-processed;

a gas introducing mechanism 133 configured to introduce gas into said process chamber;

a first exhaust path (mechanism) 72 and a second exhaust path (mechanism) 70;

Rossman further teaches that a system controller 160 and computer program 163 control and dictate the gas flows and other parameters of a particular process (includes exhaust mechanism operation and control) (Paragraphs 0031, 0038, 0049, 0054, 0057).

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Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a system controller as taught by Rossman in the apparatus of Schmitt to provide automated control over substrate processing.

Regarding Claims 7,14,17: Rossman teaches that the apparatus (Figure 7A) comprises a microwave generator 151 configured to generate a microwave for plasma processing of the substrate, wherein reactive gas is used as the gas for cleaning, and wherein said microwave generator generates the microwave also when the inside of said process chamber is cleaned (Paragraph 0054).

Claims 8, 9, 15, 16, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitt (US PG PUB No. 2004/0052972 in view of Xi et al (US PG PUB. No. 2003/0198754) as applied to Claims 3, 12 and further in view of Rossman (US PG PUB No. 2003/0211735).

Regarding Claims 8,15: Schmitt in view of Xi et al teach all limitations of the claim but do not expressly teach concurrent exhausting by the first and second exhaust channels.

Rossman teaches a substrate processing apparatus (Figures 6, 7A) comprising:
a process chamber 113 in which a substrate 117 is plasma-processed;
a gas introducing mechanism 133 configured to introduce gas into said process chamber;

a first exhaust path (mechanism) 72 and a second exhaust path (mechanism) 70;

Rossman further teaches that a system controller 160 and computer program

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163 control and dictate the gas flows and other parameters of a particular process (includes exhaust mechanism operation and control) (Paragraphs 0031, 0038, 0049, 0054, 0057).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a system controller as taught by Rossman in the apparatus of Schmitt in view of Xi et al to provide automated control over the substrate processing.

Regarding Claims 9,16,18: Rossman teaches that apparatus (Figure 7A) comprises a microwave generator 151 configured to generate a microwave for plasma processing of the substrate, wherein reactive gas is used as the gas for cleaning, and wherein said microwave generator generates the microwave also when the inside of said process chamber is cleaned (Paragraph 0054).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rakesh K. Dhingra whose telephone number is (571)-272-5959. The examiner can normally be reached on 8:30 -6:00 (Monday - Friday). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rakesh Dhingra



Parviz Hassanzadeh
Supervisory Patent Examiner
Art Unit 1763